Kerto® LVL

Kerto® LVL is a verstile material which is suitable also for demanding structures with unusual shapes, like curved beams. It can be shaped and formed with ordinary wood working tools and equipment.

Kerto LVL can be shaped into curved beams by two different methods. These methods include machining products into curved shape or gluing and bending Kerto LVL lamellas into shape similarly as glulam. The methods can also be combined.

Machined curved beams

Curved beams can be machined from Kerto LVL Q-panel. The maximum panel size limits the possible beam span and radius of the curve. In most cases Q-panel is the material for machined curved beams. In some cases also Kerto LVL S-beam may be used when radius of the curve is small. Tables 1 and 2 present the reduction factors of strength and stiffness properties for curved Q-panel and S-beam members. CNC machining can be ordered form Metsä Wood. For more information, please see Kerto LVL Manual – Further Processing.

Figure 1. Curved Kerto LVL in Clamart Sports Complex, France

Bent beams

Kerto LVL beams and panels can be bent in the flatwise direction to form curved structures. They can also be bent and glued together to form more massive curved structures like in glulam manufacturing. Minimum bending radius is defined based on the bending strength and modulus of elasticity of the product. In the structural design bending and shear stress caused by the manufacturing process shall be taken into account.

Unless otherwise specified in more detail, Kerto LVL S-beam, T-stud, Q-panel and L-panel can be bent flatwise in the grain direction of the surface veneer according to the following specifications:

- Radius of curvature R ≥ 450 x panel thickness
- Bending only in the grain direction of the surface veneer

Unless otherwise specified more in detail, Q-panel and L-panel can also be bent flatwise perpendicular to the grain direction of the surface veneer according to the following specifications:

- Radius of curvature R perpendicular to surface veneer grain direction ≥ 350 x panel thickness
- Bending only perpendicular to the grain direction of surface veneer

Figure 2. Machined Kerto LVL in Clamart Sports Complex, France

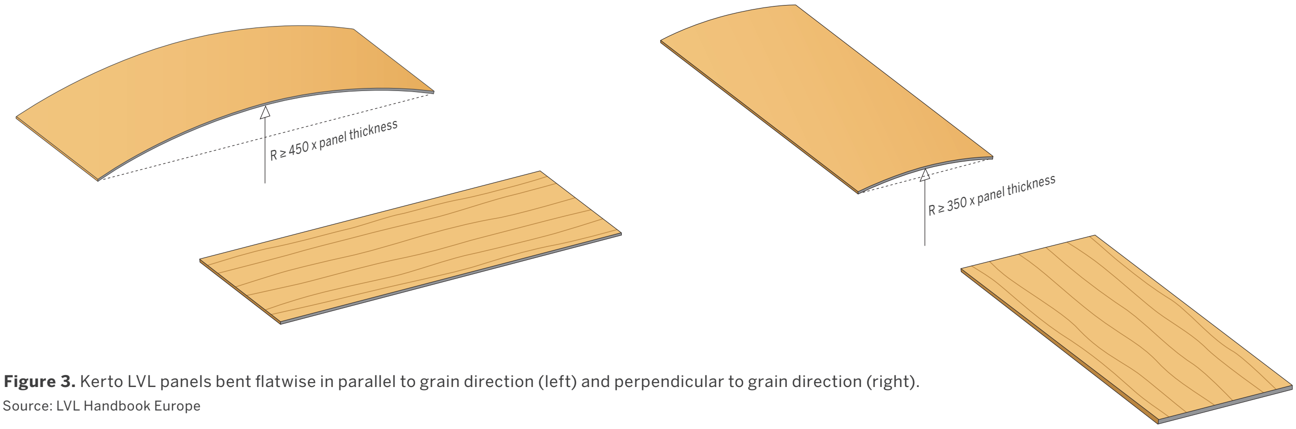

Figure 3. Kerto LVL panels bent flatwise in parallel to grain direction (left) and perpendicular to grain direction (right).
Source: LVL Handbook Europe

TABLE 1. REDUCTION FACTORS FOR STRENGTH AND STIFFNESS PROPERTIES FOR Q-PANEL, WHEN α IS THE ANGLE BETWEEN THE TANGENT OF THE CURVE AND THE GRAIN DIRECTION OF THE SURFACE VENEER

	Angle α								
	0°	2.5°	5°	10°	15°	30°	45°	60°	90°
Bending, edgewise	1.00	1.00	0.75	0.55	0.40	0.25	0.20	0.20	0.22
Bending, flatwise	1.00	1.00	0.90	0.70	0.50	0.25	0.20	0.20	0.22
Tension parallel to grain	1.00	1.00	0.90	0.70	0.40	0.25	0.20	0.20	0.23
Compression parallel to grain	1.00	1.00	0.90	0.70	0.50	0.35	0.25	0.25	0.35
Modulus of elasticity	1.00	0.90	0.80	0.60	0.40	0.15	0.10	0.10	0.23

Intermediate values can be interpolated.
Source: Eurofins Product Certificate: EUFI29-20000676-C

TABLE 2. REDUCTION FACTORS FOR STRENGTH AND STIFFNESS PROPERTIES FOR S-BEAM, WHEN α IS THE ANGLE BETWEEN THE TANGENT OF THE CURVE AND THE GRAIN DIRECTION OF THE SURFACE VENEER

	Angle α								
	0°	2.5°	5°	10°	15°	30°	45°	60°	90°
Bending, edgewise	1.00	0.90	0.75	0.45	0.25	0.10	0.05	0.05	0.02
Bending, flatwise	1.00	0.90	0.80	0.55	0.30	0.10	0.05	0.05	0.02
Tension parallel to grain	1.00	1.00	0.90	0.60	0.30	0.05	0.02	0.02	0.02
Compression parallel to grain	1.00	1.00	0.90	0.65	0.40	0.20	0.17	0.17	0.17
Modulus of elasticity	1.00	0.90	0.80	0.60	0.40	0.15	0.05	0.05	0.03

Intermediate values can be interpolated.
Source: Eurofins Product Certificate: EUFI29-20000676-C

Figure 4. Machined Kerto LVL in Metropol Parasol Sevilla, Spain

Figure 5. Bent Kerto LVL in Dome of Visions 3.0, Denmark